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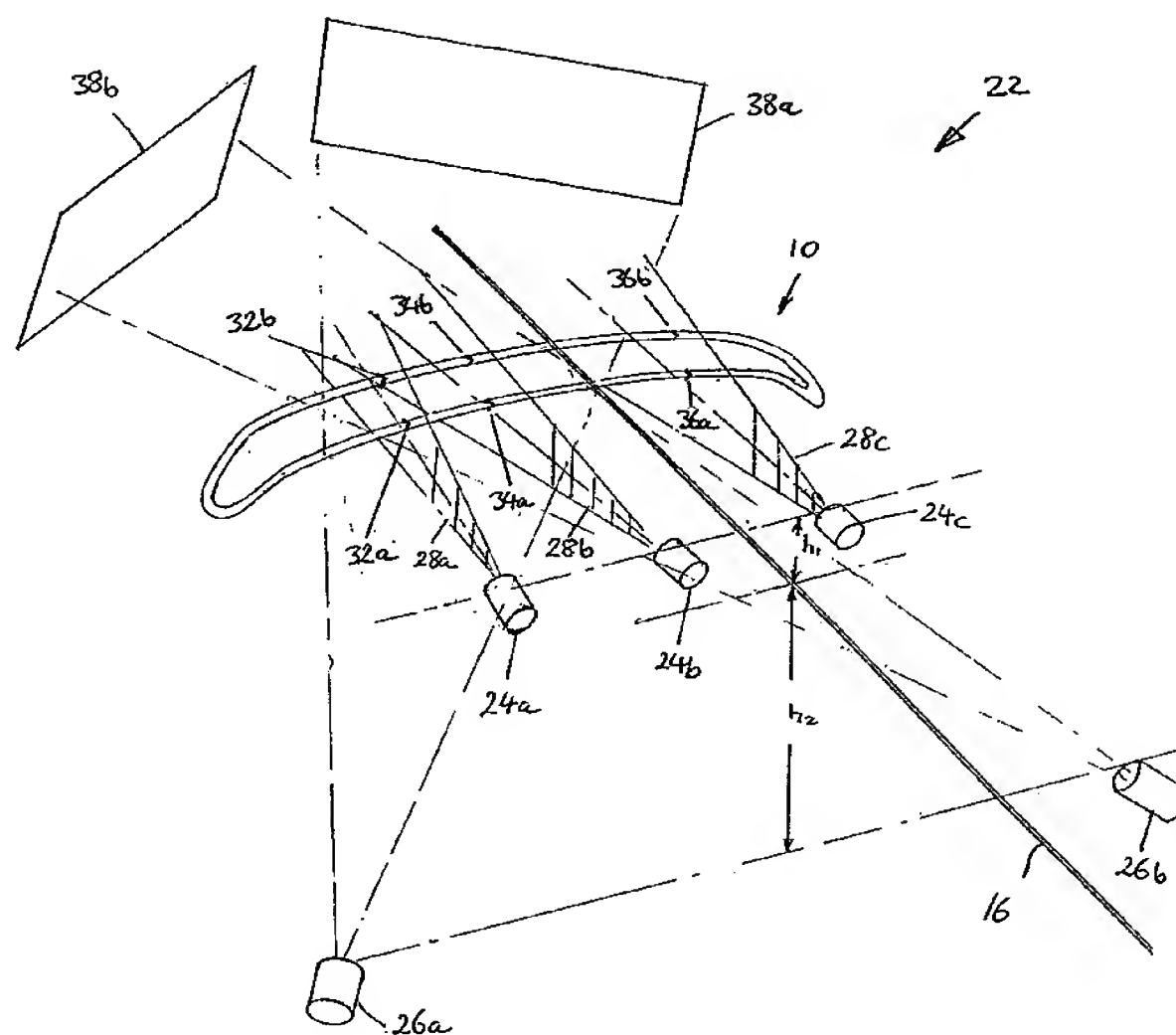
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(54) Title: OPTICAL METHOD OF DETERMINING A PHYSICAL ATTRIBUTE OF A MOVING OBJECT



(57) Abstract: A method for optically determining a physical attribute of a moving object, such as the height  $h$  of the carbons (14) of a pantograph head (10). This method incorporates a method for optically establishing a mathematical spatial relationship between one or more cameras (26) and one or more fanned lasers (24) each capable of projecting a laser beam along a laser plane (28). The method comprises: establishing an orientation and location of each camera (26) with respect to a co-ordinate system; establishing an orientation of each laser plane (28) within the co-ordinate system; and deriving a transformation function for calculating the three dimensional position of points within the plane (28) of each respective laser beam from a pixel location within a pixelated image created by each of the cameras.

WO 2005/090903 A1